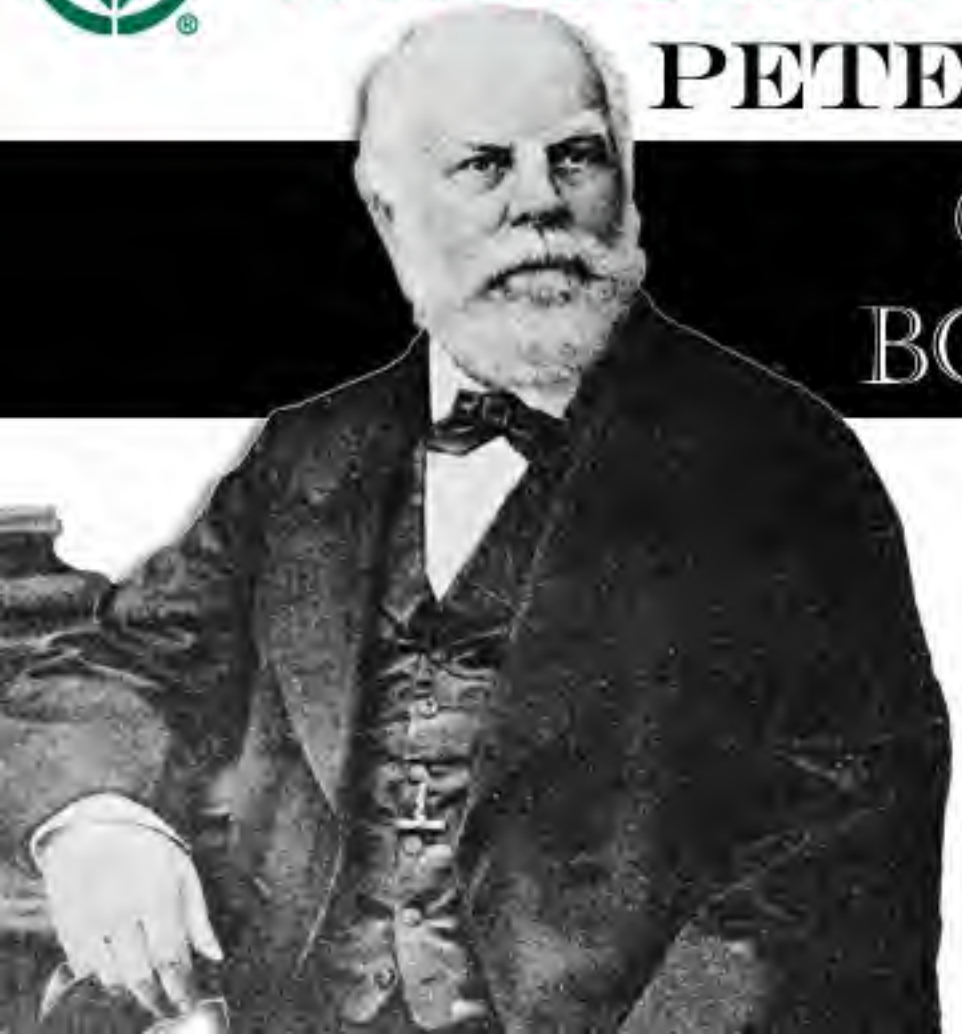
Missouri Botanical Garden
Peter H. Raven Library

George Engelmann Botanical Notebooks



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1-624

Yamacoa

7757

MISSOURI BOTANICAL GARDEN
GEORGE ENGELMANN PAPERS

0 1 2 3 4 5 6 7 8 9 10
cm
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Lemna

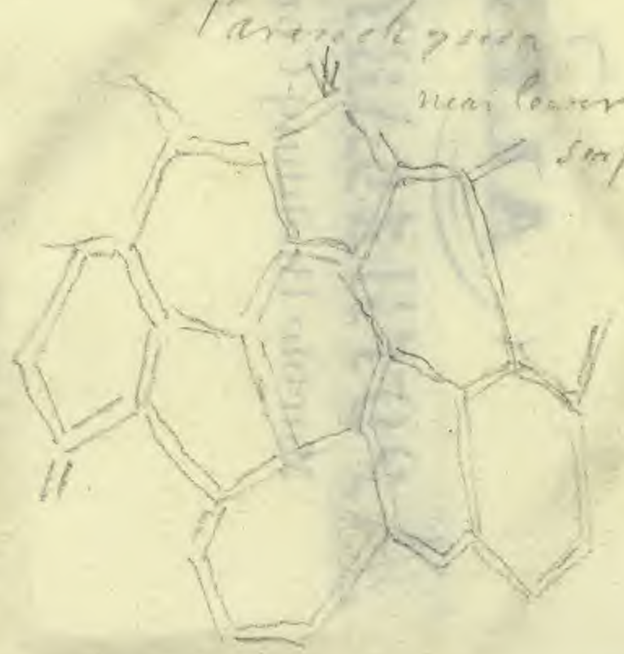
Oct 26 186?

Panama, Le Conte ... = Mc Tonry

stomate rare.

lower surface

Parmelia ?



near lower surface

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GEORGE ENGELMANN PAPERS

ALEX. LEITCH,
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Marble Building Cor. Fourth & Olive Sts. St. Louis, Mo.

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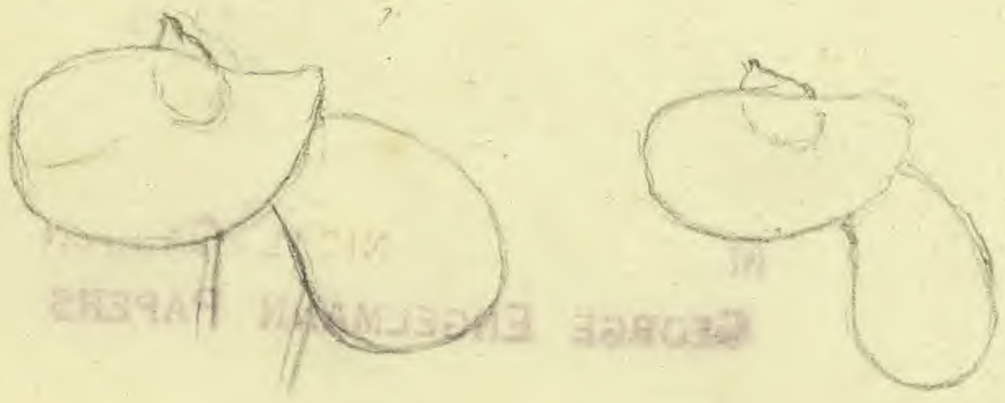
Lemna [illegible]

Oct 27 1867

Panama, LeConte ex Mr. Torrey

x60

x10



varietas e minor, crassior, subtus convexior pallidior; frondu minore; epidermidi cellulis minoribus, minus sinuosis, in facie superiore stomata (cum cellulis marginalibus) magnitudine aequantibus

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M . . NICAL GARDEN
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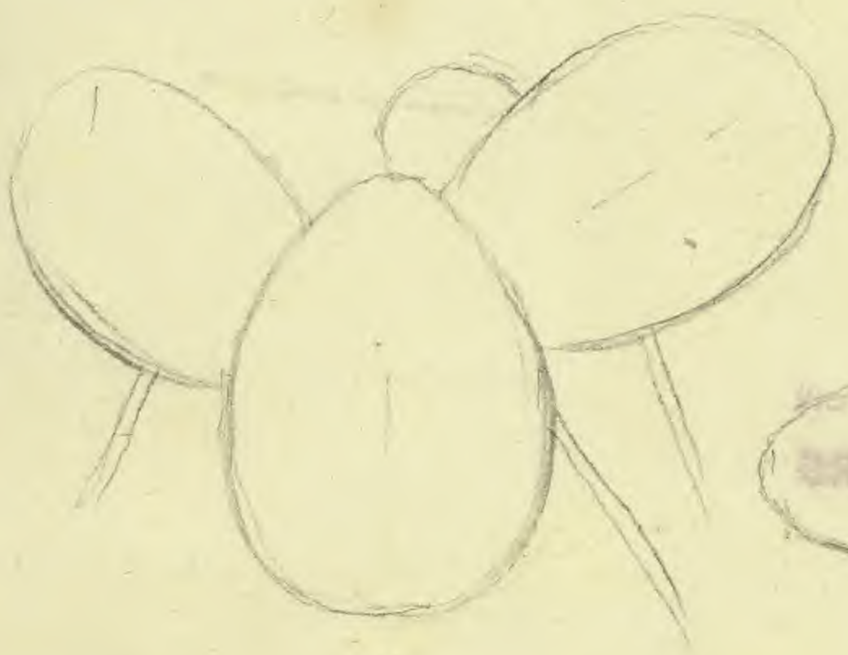
Lemna

Oct 21 1867

San Francisco Delaunder Sept 1867

(sine fructu)

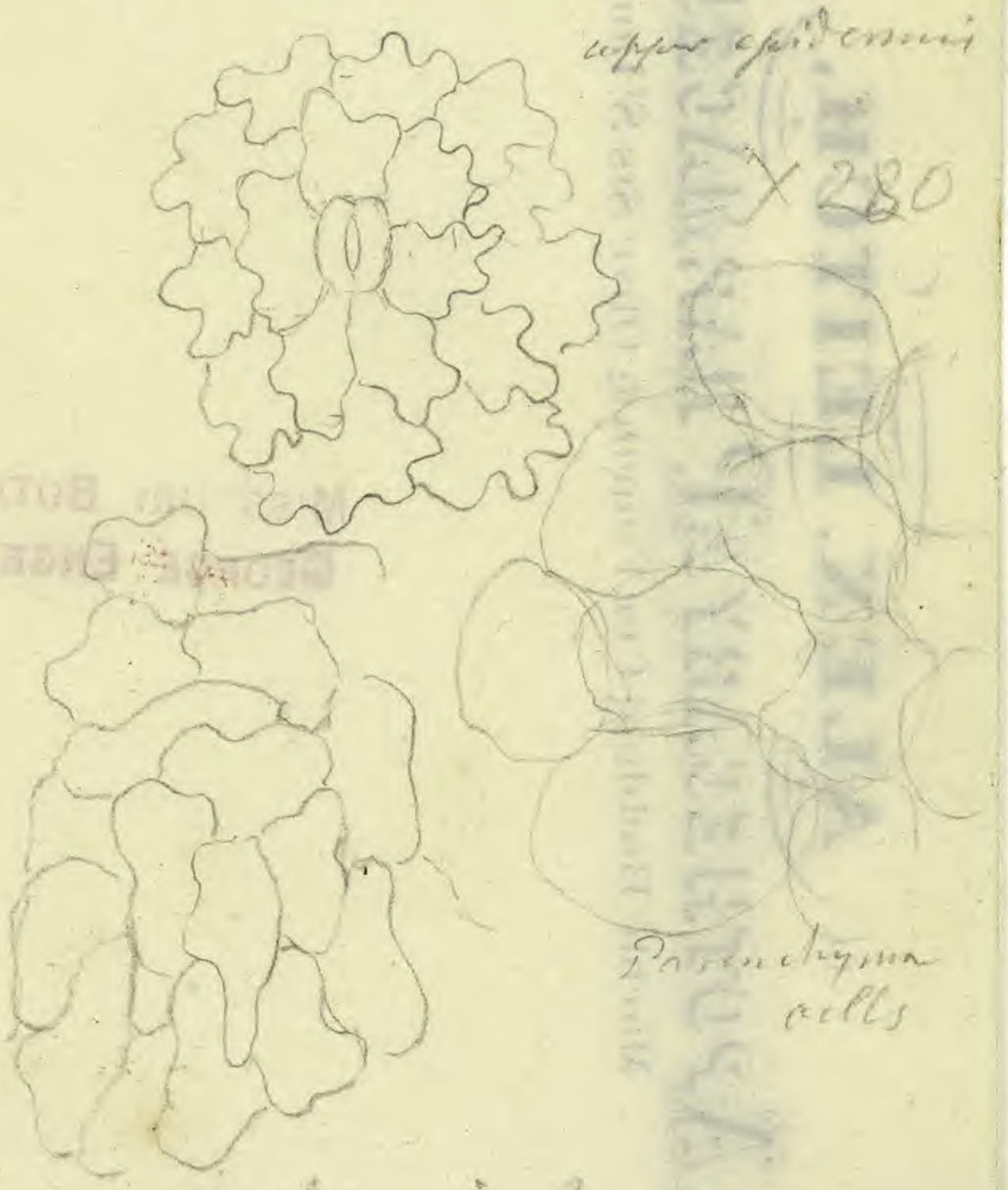
X10



Mostly single or in twos
1 nerve, indistinct, or none

upper epidermis

X280



Parenchyma cells

epidermis of lower side

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Lemna

Lobar Creek Calif

Nov 13 1867

5 Octob 1867

x10

transparent margins

old specimens dark spots are formed by bundles of raphides

x10 smaller young specimens

x28

dry plant soaked

x280

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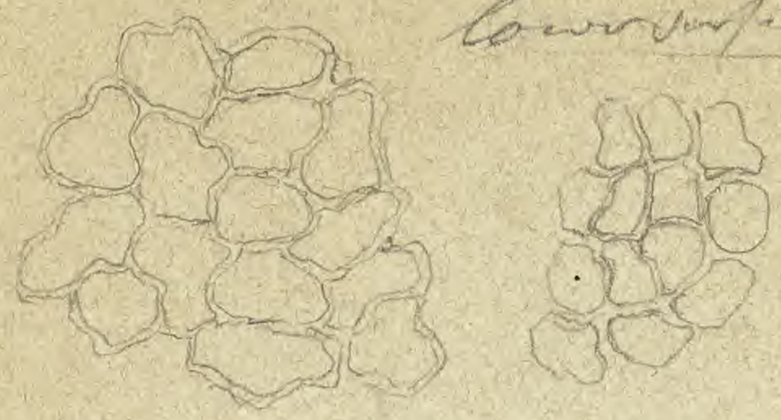
June 29 1870

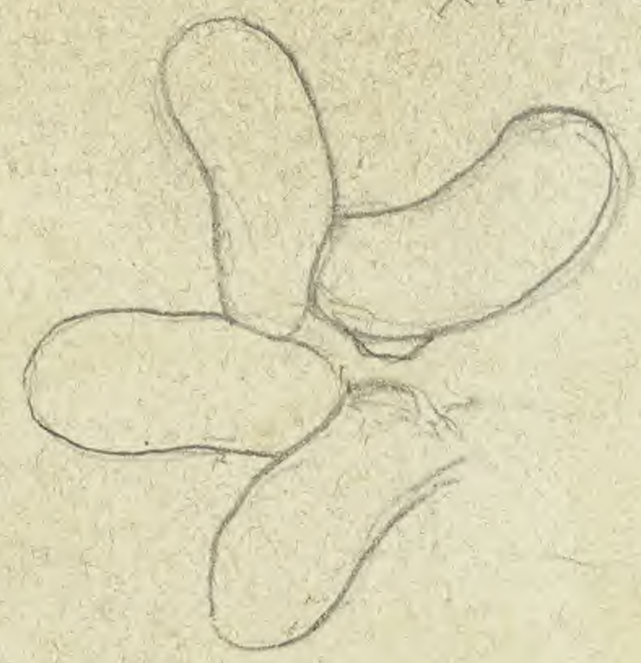
Lemna

with L. trisulca, Summit springs, Nevada, June 29. 1868
Conv. surface, epidermis ×280 S. Watson



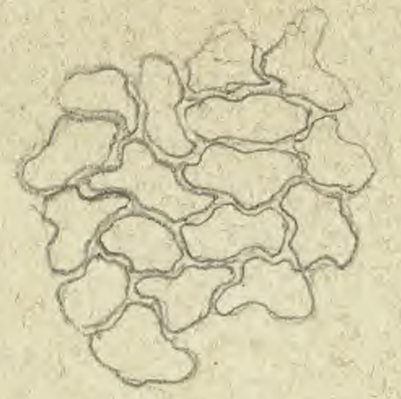
no stomata

×10



no roots

upper surface
no stomata seen
×280



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Mean....	10.1	11.6	8.6	7.4	8.2	9.0	9.2	....	.....

2.—*Monthly mean of Temperature, Fahrenheit.*

MARCH.

YEAR.	AT 6 A. M.	9 A. M.	12 M.	3 P. M.	6 P. M.	9 P. M.	MEAN OF MONTH.
1861.....	37.1	41.1	48.2	51.6	47.6	43.4	44.8
1862.....	36.0	40.1	46.9	48.0	45.6	42.5	43.2
1863.....	36.7	40.9	47.5	49.5	46.1	42.3	43.6
1864.....	34.1	38.7	44.6	45.9	42.2	38.6	40.7
Mean.....	36.0	40.2	46.8	48.7	45.4	41.7	43.1

APRIL.

1861.....	49.6	56.5	62.7	65.1	59.8	55.1	58.1
1862.....	46.5	53.3	59.5	60.8	57.6	52.3	55.0
1863.....	47.3	55.7	62.9	64.4	60.0	54.4	57.4
1864.....	45.0	50.8	55.3	56.6	54.1	49.5	51.4
Mean.....	47.1	54.1	60.1	61.7	57.9	52.8	55.5

0 cm 1 2 3 4 5 6 7 8 9 10
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III.—*Atmospheric Perturbations.* A writer in the London Intellectual Observer, in reviewing Admiral Fitzroy's Weather Book, thus writes of Atmospheric Perturbations:

The earth's atmosphere is divisible into two portions, lower and upper—the *stable* and the *instable*. It is not meant that absolutely no motion or change takes place in the upper division, but all the phenomena of winds and storms occur in the lower one, as explained in a former number. Opinions differ as to the total height to which the atmosphere extends. Admiral Fitzroy supposes that "as air, from ten to twenty miles seems a probable total depth," while about seven miles seem to be the limit in which man can exist. We do not perceive precisely what the Admiral means by the phrase "as air," but he may agree with the opinion of Quetelet, that the composition of the atmosphere may not be the same at great elevations, where the pressure becomes infinitesimal. However this may be, we do not coincide with his view that the total height is less than is usually supposed, but prefer the opposite supposition of the distinguished Belgian philosopher. Still, so far as relates to weather prognostications, our researches must be chiefly devoted to what takes place within a few thousand yards of the earth's surface; and if the loftier regions—in which miles of elastic matter in the gaseous form contribute next to nothing to the total weight of the atmosphere, as shown by the barometric tube—should ultimately be found to exert a noticeable influence upon the perturbations of the lower layers, it will probably be on account of the magnetic disturbances of which Quetelet conceives them to be the scene. The instable portion of the atmosphere is much lower in winter than in summer; but even when its volume, and consequent height, is enlarged by the action of solar heat, it can not reach much above the highest mountain top. The chief cause of air currents or winds is undoubtedly

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Lomaria paucivestita

St Domingo Feb 5 1871

May 8 1871

Parry & Wright

x60

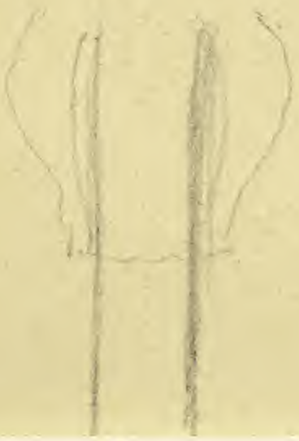
empty seed shell

found loose among the Detritus

x10

only fructifying specimen seen

both sent to Hegelmaier



sheath of young root

x60

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Leitch & Collies
CONSERVATORY & GREENHOUSES
South West Corner Fifth and Market Streets

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cm
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MISSOURI BOTANICAL GARDEN

Sept 21 18[illegible]

Lemna perpusilla Torr.

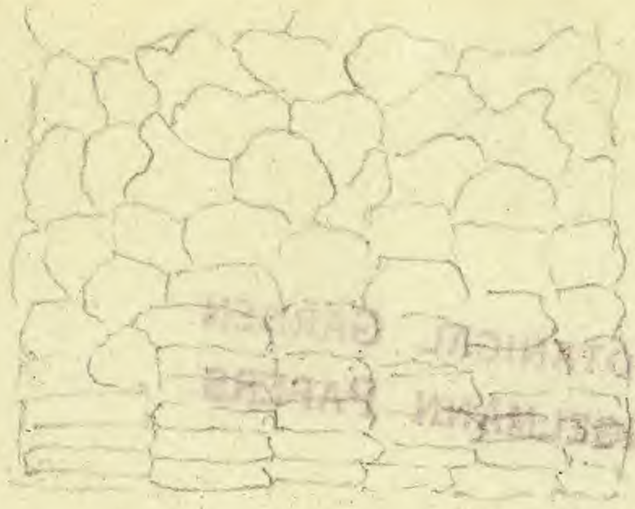
ponds in East Stoneham

full with willows

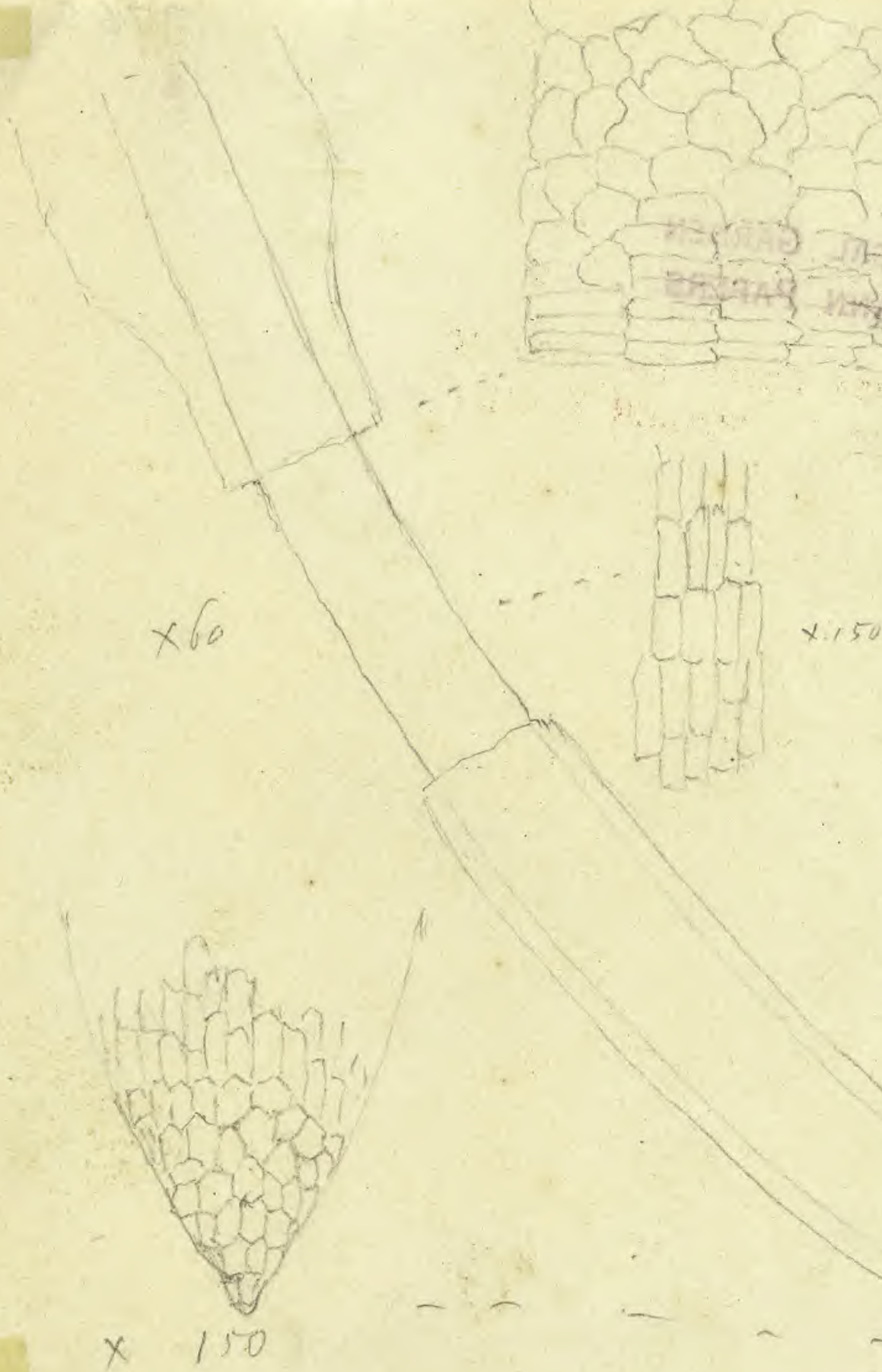
in flower

no other Lemna mixed with it

very rare with vegina and hood



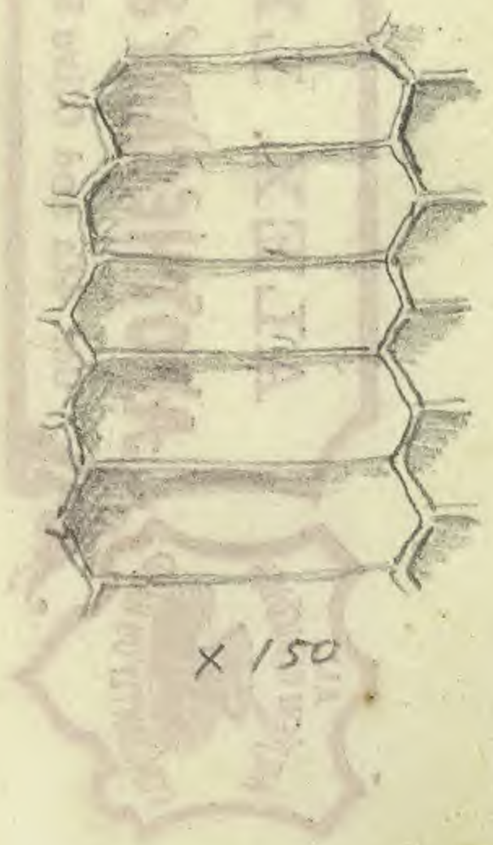
×150



×60

×150

×60



×150

× 150

cm 0 1 2 3 4 5 6 7 8 9 10
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Flora of Missouri.

F. W. DEWART.

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cm
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Missouri Botanical Garden

GEORGE ENGELMANN PAPERS
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August.....	3	.....	1	.....	1	2 .....
September.....	4	.....	.....	1	4	8 .....
October	3	1	1	1	7	1 .....
November	2	3	.....	7	.....	7 .....
December	2	3	.....	.....	.....	6 .....
	50 + el.	36 + el.	23 — el.	28 — el.	15 no el.	34 no el.

Snowing was accompanied

	By Positive Electricity.		By Negative Electricity.		By no Electricity.	
	In 1861.	In 1862.	In 1861.	In 1862.	In 1861.	In 1862.
January.....	3	9	.....	2	.....	.....
February	12	8	.....	1	.....	.....
March	3	12	.....	.....	.....	.....
October.....	.....	1	.....	.....	.....	.....
November	.....	4	.....	.....	.....	.....
December	5	2	2	.....	.....	1 .....
	23 + el.	36 + el.	2 — el.	3 — el.	.....	1 no el.

REMARKS.

The monthly mean of atmospheric electricity in 1862 was not quite so regular as that in 1861. While in 1861 an un-

December; the second with a mean electricity by the months of March, April, May and October; and the third with the lowest electricity by the months of June, July, August and September.

The aggregate monthly mean of

The first group in 1861 is	52.9	—in 1862,	54.6
The second	"	"	33.5	"	35.2
The third	"	"	14.1	"	10.5

Thus in 1861 the third group prevailed, and in 1862 the first and second. But these differences are so well balanced throughout the year, that the mean of the whole year in 1861 and in 1862 is exactly the same, namely, 8.4. Such an identity in the yearly result, even to decimals, is of course not to be expected every year; but it seems to prove, at least, that the yearly mean of electricity is as constant as that of temperature, of relative humidity, and of atmospheric pressure.

The third table, showing the daily periodicity of atmospheric electricity, confirms the daily two maxima and two minima of electricity as an undeniable fact.

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Lemna perpusilla
multirostata
Sept 1 1867
Ex Hb. E Hall Athens Ill, c. Diplogyrkiza

×60

×10

largest

smallest

ribs very indistinct

epider of upper side

parenchyma

very young
×60

of lower side

×150

× 280

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cm
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JONES & LETCH

Druggists

Cor. Fifth & Market Sts. St. LOUIS, MO.

MS
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Leucium serpentilla Aug 25 1857
var. pumirostris St Louis

× 60 × 150

anterior part of frond

posterior

flower bud, yet inclosed in frond cleared by immersion in ether

ovule of bud × 280

Pollen of stem very conspicuous

= 0,020 mm = × 1/15

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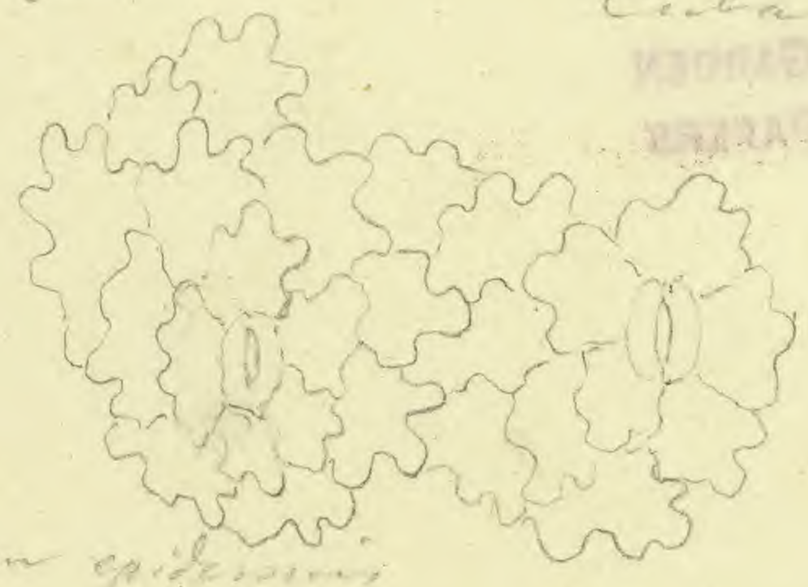
Lemna

Oct 27 1867

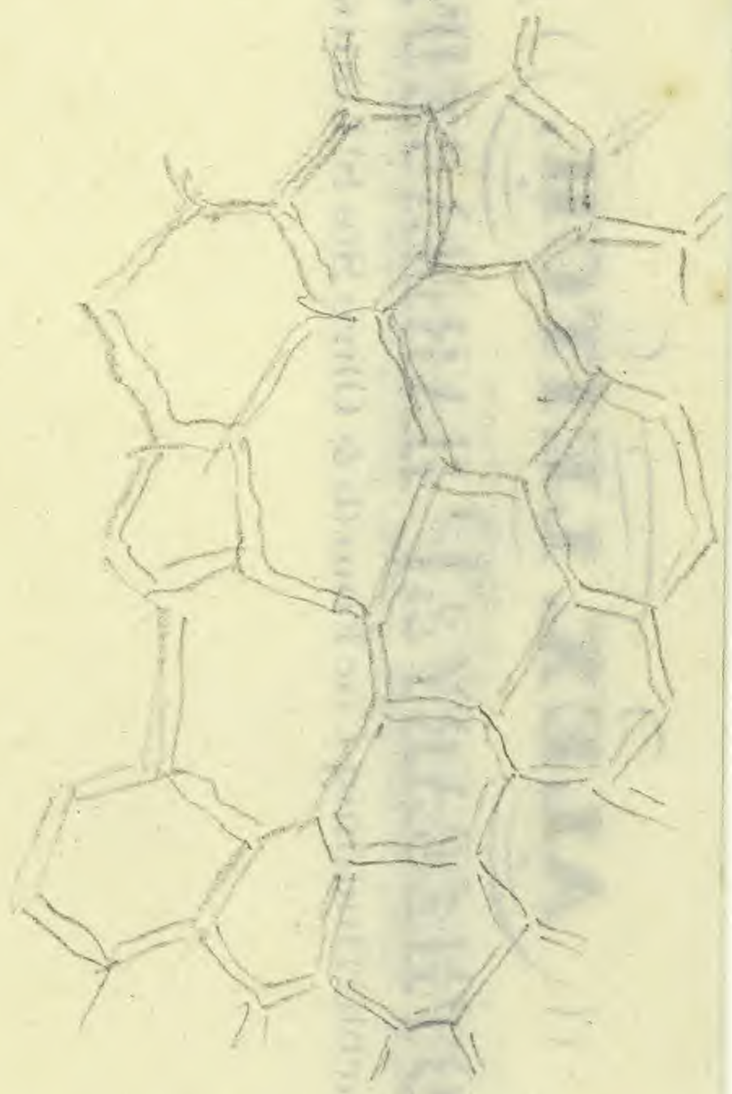
Cuba

3215

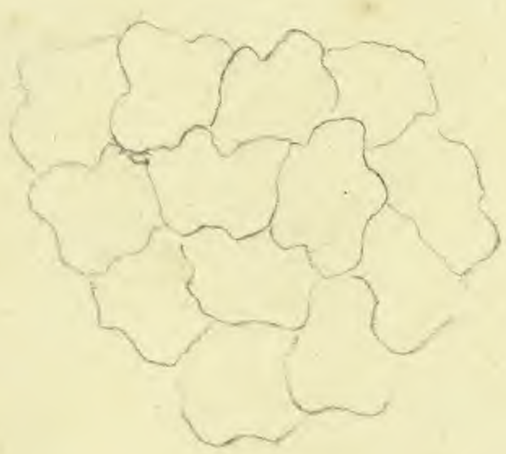
× 280



upper epidermis



lower surface



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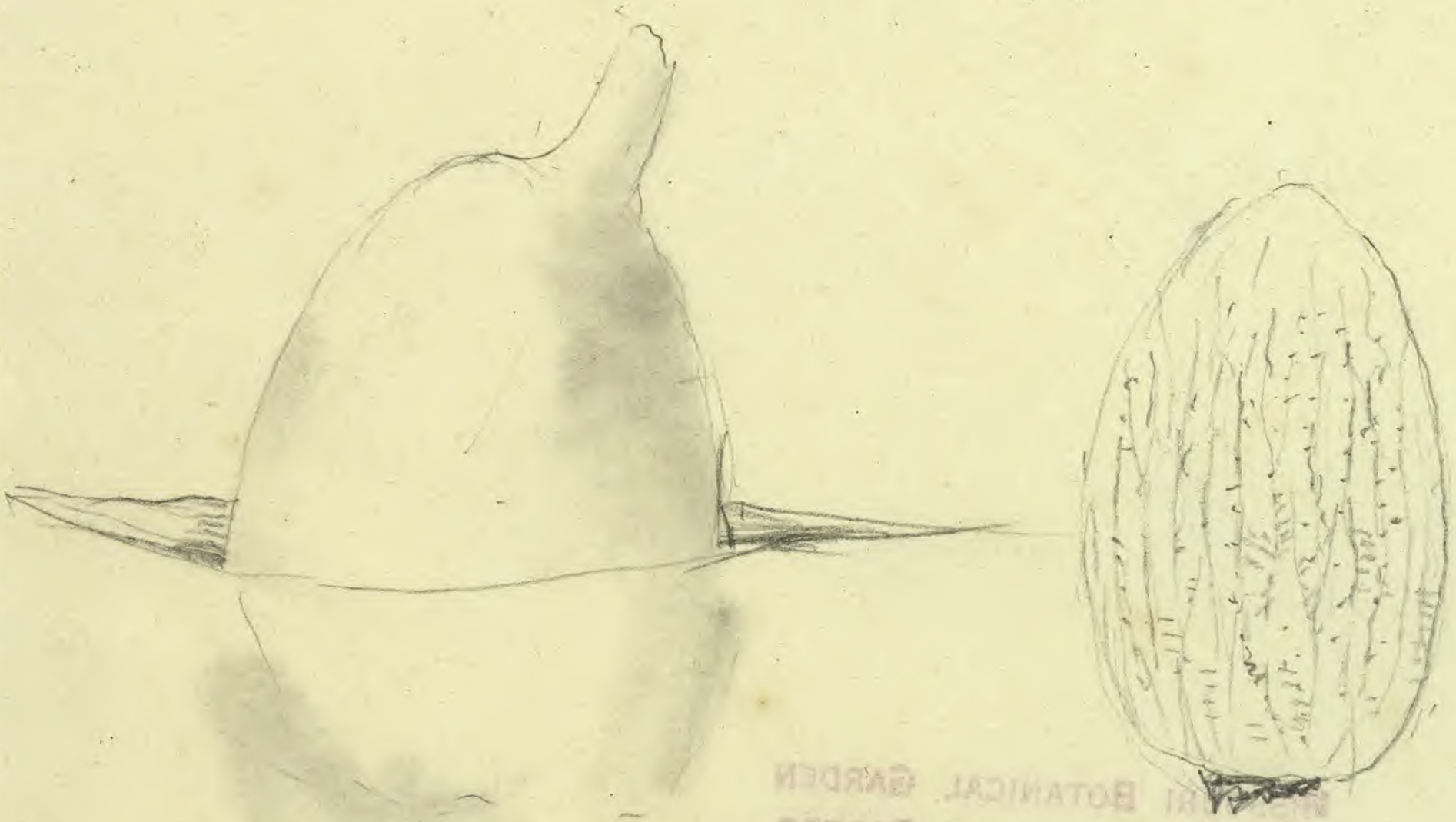
Lesquerella purpurascens

Aug 1867

Wayne Co., Tn. August
Oct. 1860



Label 12
Sub Nigra

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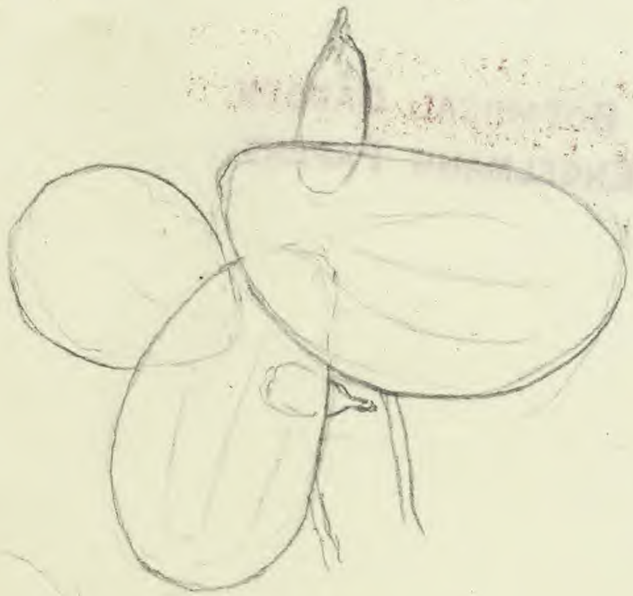
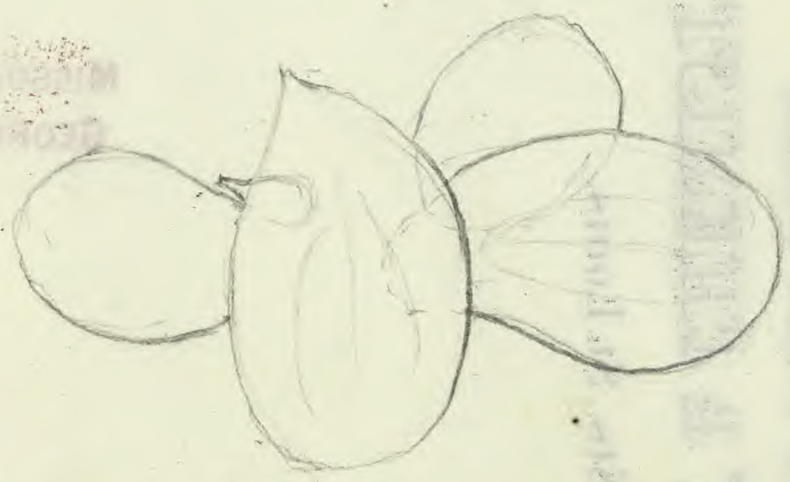
Lemna perpusilla Torr

July 10 1867

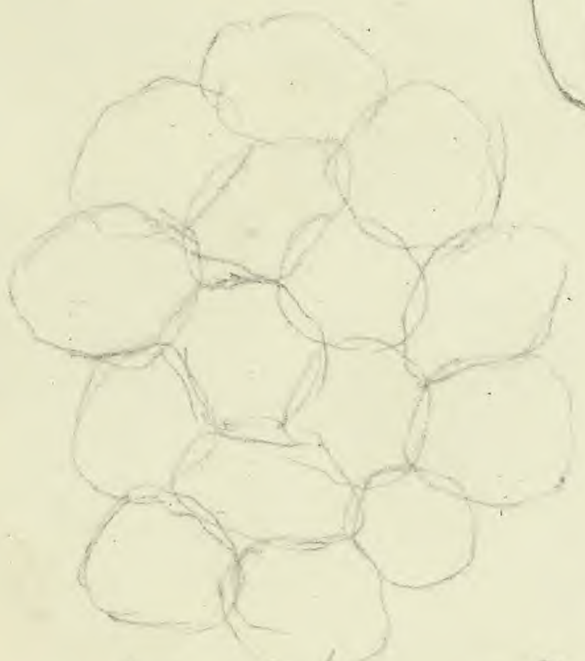
Wayne Co Pa Austin

Largest frond seen





I have seen several times a young frond from the same slit as the first in these specimens



Marchantia cells x 280

x 280

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cm
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Alex. Leitch.

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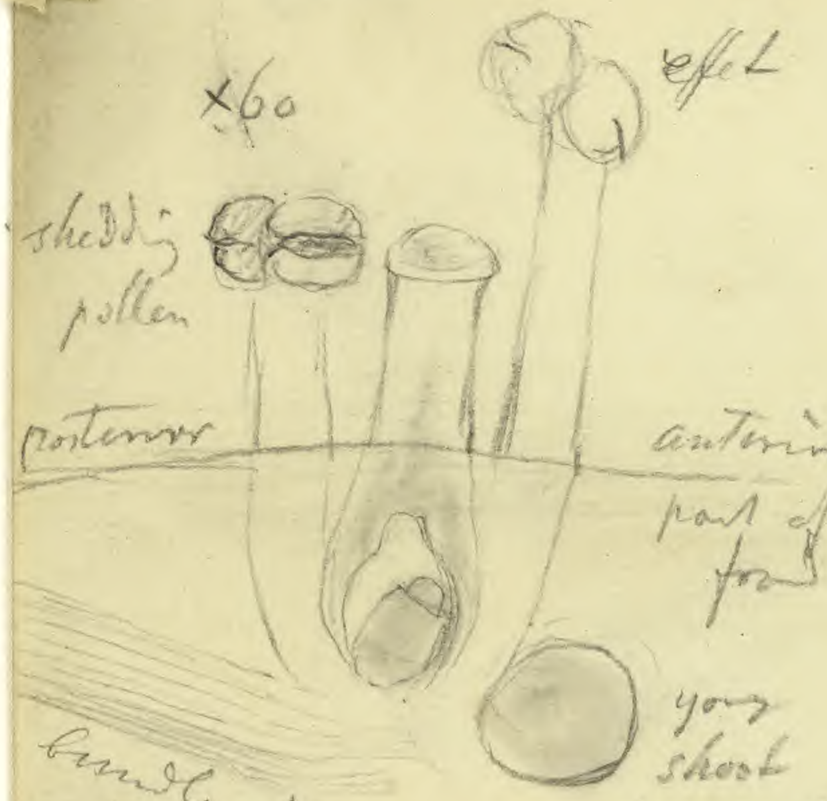
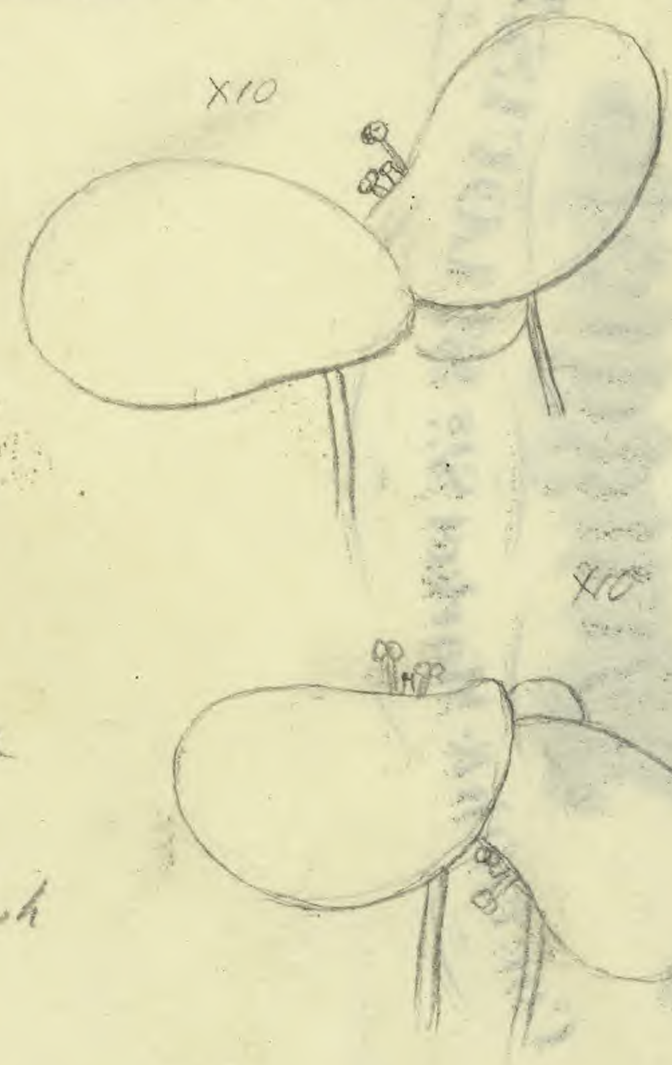
Cor. 4th & Olive Sts., St. Louis.

Aug 21 1867

Lemna perpusilla
var punctostata Hegel
Am. Bottom opp. St Louis



ovule ×280
somewhat squeezed under the glass
transparent by Polish



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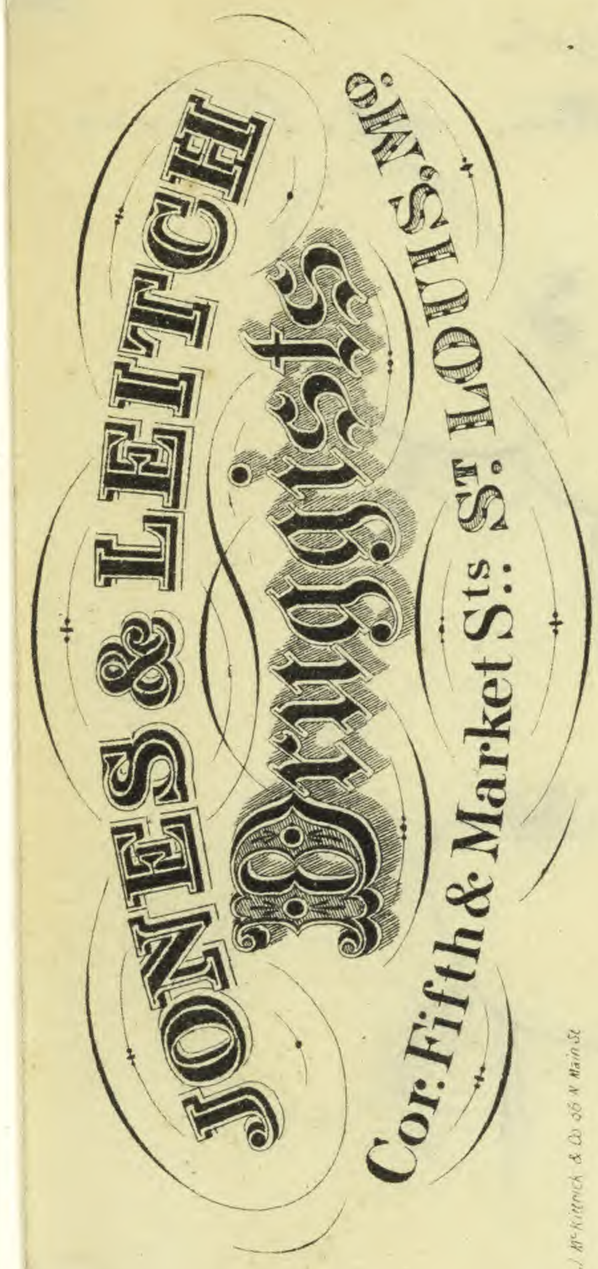

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Lemna perpusilla
var pauciristata Hegelm.

Aug 21 1867

dark sloughs ± Amer. Cotton opp. St Louis

×280

×60

Living

×10

fruit

parenchymatous cells

epidermis of upper

flower

Largest frond seen

2–4 ribs visible
quite prominent
distant cross linealation

of lower side

×280

×150

section of seed

×615

0.023 × 0.027 mm

0.023 – 0.024 mm

×60

flowers ×60, anthers open shedding pollen

Pollen grains mostly somewhat oval spinulose

7774

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GEORGE ENGELMANN PAPERS

JONES & LETCH

Druggists

Cor. Fifth & Market Sts. ST. LOUIS, MO.

J. McKittrick & Co. 56 N. Main St.

0 1 2 3 4 5 6 7 8 9 10
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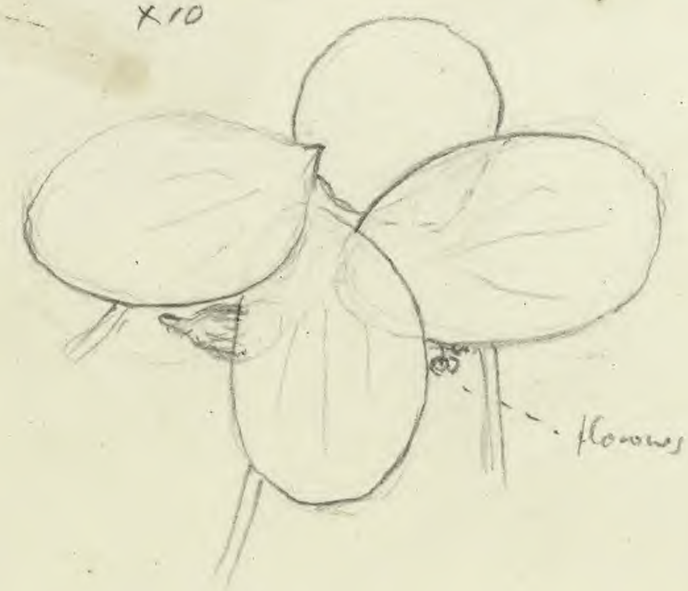
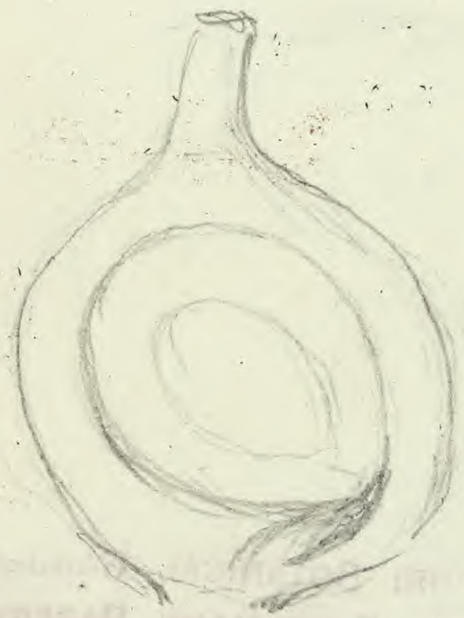
MISSOURI BOTANICAL GARDEN

Lemna perpusilla
Cass Co Mo
July 10 1864
J C Arrowhead, Sept 20 1864

×10

Flowers





young fronds ×60
treated with Bleach

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cm
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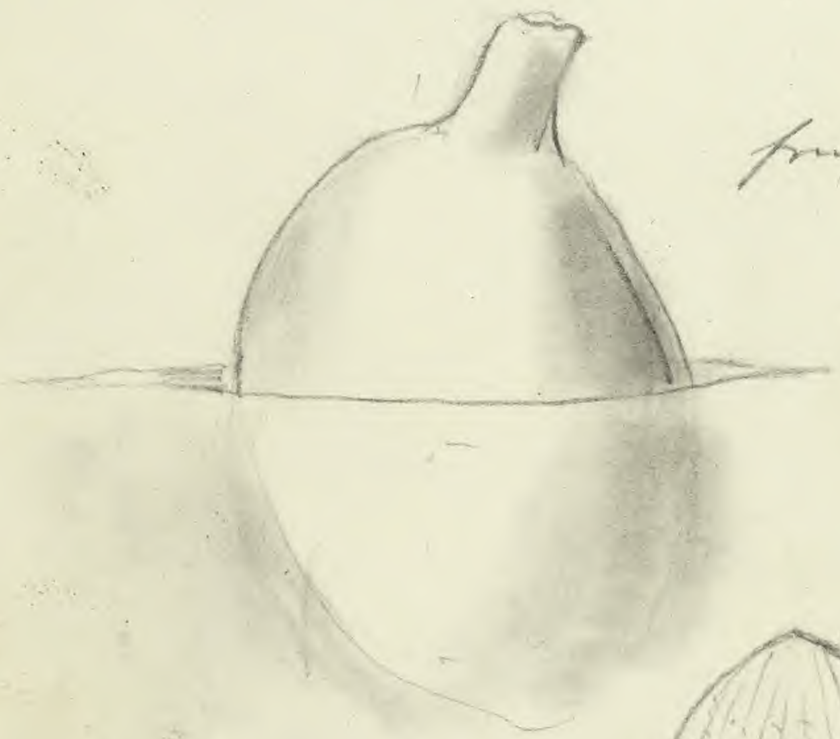
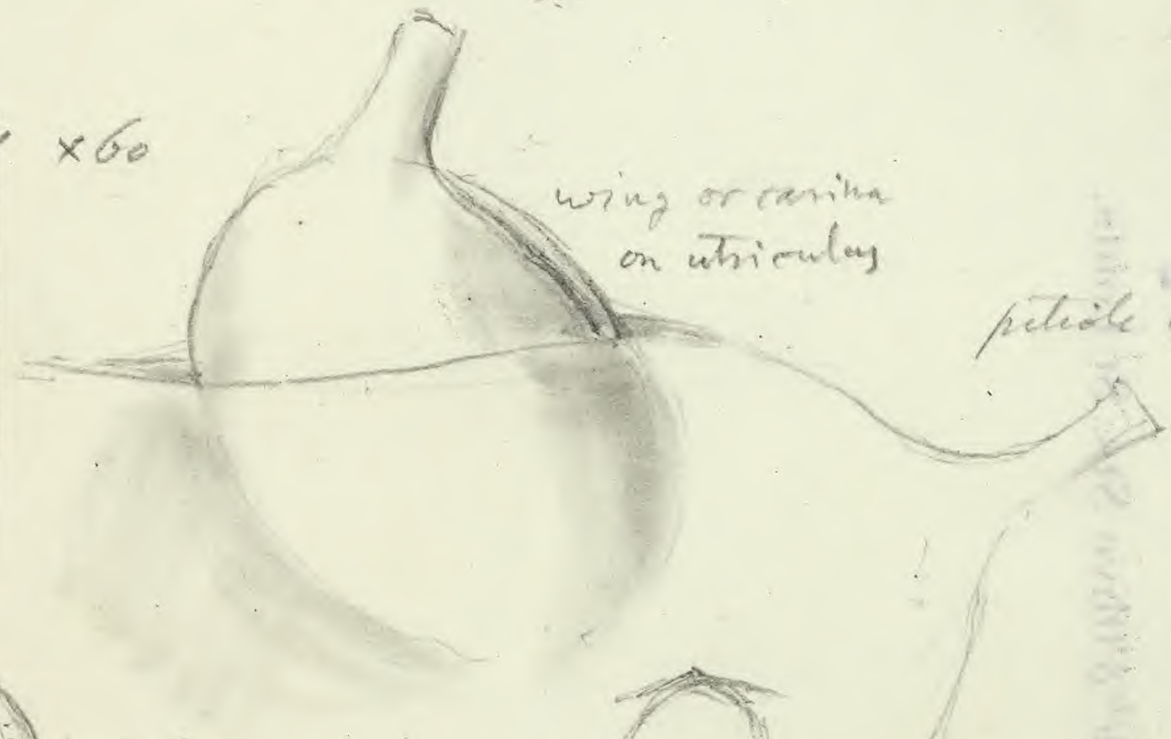
Lemna pygmaea
Cass Co Mo G. C. Broadhead
July 8 1867

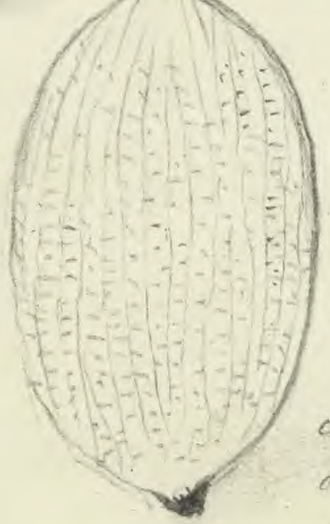
fruit ×60



wing or carina on utricules

petiole of frond (included)





seed ×60

about 15 ribs visible indistinct with cross grooves or indistinct reticulation

×60

embryo

0 1 2 3 4 5 6 7 8 9 10
cm
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MISSOURI BOTANICAL GARDEN

7776

Alex. Leitch.

APOTHECARY & CHEMIST.

Cor. 4th & Olive Sts., St. Louis.

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0 1 2 3 4 5 6 7 8 9 10
cm
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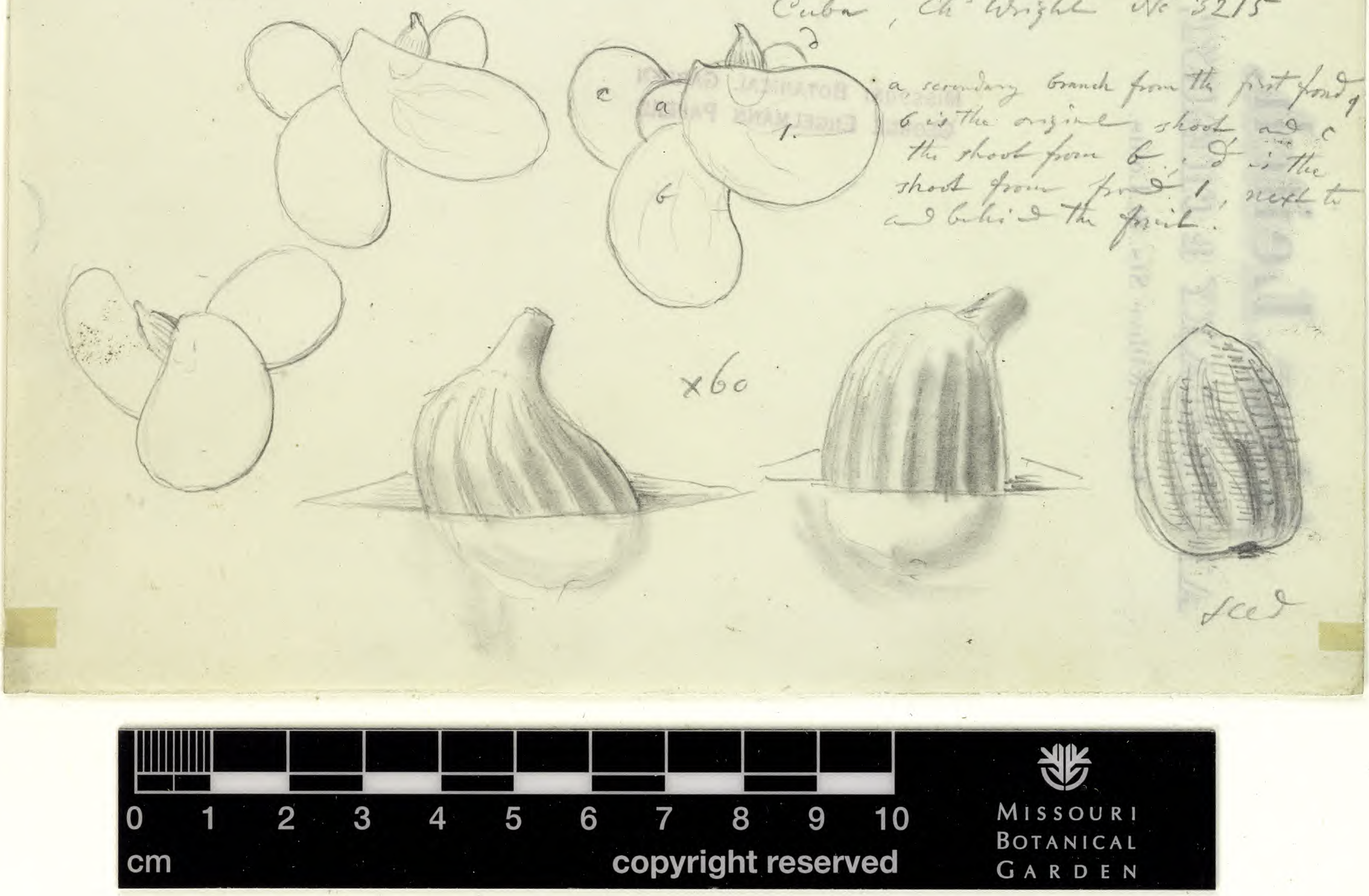
Lemna perpusilla

July 14 1867

var *parvirostata* Hegelm

Cuba, Ch[s] Wright No 3215



a, secondary branch from the first frond
b is the original shoot a & c
the shoot from b, d is the
shoot from frond 1, next to
a & behind the fruit.

0 1 2 3 4 5 6 7 8 9 10
cm
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